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become as good a scientific thinker as Faraday or Darwin; but to-day, while fallacies of the crudest kind are rampant in every field of discussion, from religion and party-politics to

biology and political economy, something less ethereal and impalpable than this statement of the necessity of philosophic doubt would have been far more useful.

RECENT PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Academy of natural sciences, Philadelphia.

July 8. — Professor Angelo Heilprin described a new trilobite from Walpack Ridge, about ten miles north of the Delaware Water-Gap. The tail-piece, which was the only part of the animal found, indicated an individual some six or seven inches or more in length, and clearly demonstrated its relationship to the genus *Phacops*, sub-genus *Dalmania*. Among its faunal associates were *Phacops Logani*, P. (*Dalmania*) *pleuroptyx*, *Acidaspis tubercularus*, *Spirifer macroleura*, *Atrypa reticularis*, *Strophomena punctulifera*, *S. rhomboidalis*, *Orthis subcarinata* (or *O. multistriata* ?), *Merista* sp., etc. The horizon is that known as the Stormville shales (lower Helderberg), evidently the equivalent of the Delthyris shales of the New-York geologists.

Philosophical society, Washington.

April 26. — Prof. J. R. Eastman reported the discovery of a mass of meteoric iron at Grand Rapids, Mich. An analysis by Dr. F. W. Taylor gave: iron, 94.54; nickel, 3.81; cobalt, 2.40; insoluble, about .10; total, 100.85; specific gravity, 7.53. — Mr. William H. Dall read a paper entitled 'Certain appendages of the Mollusca.' — Mr. J. S. Diller read a communication on the volcanic sand which fell at Unalashka, Oct. 20, 1883, and some considerations concerning its composition. The substance of this communication has already appeared in *Science*. There ensued a general discussion of the nature and properties of volcanic dust, and of the theory which ascribes recent peculiar meteorologic phenomena to the dust ejected from Krakatoa. Capt. C. E. Dutton argued that the formation of volcanic dust particles by the bursting of bubbles tends to give them a somewhat definite general size, and does not produce a large amount of dust fine enough for indefinite suspension. The opposite view was maintained by Prof. H. M. Paul, and was sustained by Mr. Diller, who said that the microscope revealed no limit to the fineness of the Krakatoan dust. The higher the magnifying-power applied, the greater the number of particles visible; and this relation extends to the limits afforded by the capacity of the instrument. Professor Paul thought the violence of the Krakatoan explosion was competent to charge the atmosphere at very great altitudes, and considered the fineness of the dust a sufficient explanation of its indefinite suspension. Mr. William B. Taylor suggested that electricity might be an efficient cause of suspension. It is a common phenomenon of volcanic eruption; and dust particles charged with the same kind of electricity as the earth would be

repelled not only by one another, but by the earth. The period elapsing between sunset and the red after-glow testifies to the great altitude of the phenomenon; and at such altitude the air is not only very rare, but is anhydrous, and the discharge of electricity is impossible.

May 10. — Mr. G. H. Williams of Johns Hopkins university addressed the society on the methods of modern petrography, classifying them as chemical, mechanical, optical, and thermal, and explaining their several functions. — There followed a symposium on the question, 'What is a glacier?' Mr. I. C. Russell defined a glacier as an ice-body originating from the consolidation of snow in regions where the secular accumulation exceeds the loss by melting and evaporation (that is, above the snow-line), and flowing to regions where loss exceeds supply (that is, below the snow-line). Mr. S. F. Emmons defined it as a river of ice, possessed, like an aqueous river, of movement and of plasticity. In virtue of plasticity, it adapts itself to the form of its bed. The *névé* field is the reservoir from which it derives its supply of ice, and the initial impulse of movement. Until the *névé* moves from its wide and shallow bed into a narrower and deeper one, and thus gives outward proof of the plasticity of the ice of which it is composed, it does not become a glacier. It may become crevassed, and it may carry blocks of rock on its surface without losing its *névé* character. Mr. W. J. McGee said that the phenomena of glacier ice and *névé* belong to a graduating series, and can be only arbitrarily discriminated. He regarded as artificial and incompetent, classifications depending on acclivity of the ice-bed, on constriction of the ice-body, on ability to sustain bowlders, and on rate of motion. All things considered, the most satisfactory line of demarkation is the snow-line. Mr. William H. Dall discriminated masses of ice moving in a definite direction from fields of ice practically stationary, restricting the term 'glacier' to the former. A glacier is a mass of ice with definite lateral limits, with motion in a definite direction, and originating from the compacting of snow by pressure. Prof. T. C. Chamberlin said that the subject illustrated the fact that hard and fast lines belong only to nomenclature, whereas nature is characterized by gradations. The true distinction in this case is not structural, but genetic. There is an area of growth and an area of waste to every glacier. It is only superficially that the area of growth coincides with the *névé*, and the *névé* field is accurately defined only on the summer day of maximum waste. Capt. C. E. Dutton said that his intended remarks had been anticipated by Professor Chamberlin. Definition can

rarely or never be made rigorous. Glaciers vary in their characteristics like other groups of phenomena. While those features which characterize them are present, there is no difficulty of recognition; but exceptional cases arise in which a portion only of the diagnostic features are present, and persons who desire extreme precision of language are then compelled to hesitate. The difficulty is probably best met by the use of qualifying terms.

NOTES AND NEWS.

FELLOWS of the American association for the advancement of science, who may desire to avail themselves of the privileges of honorary membership of the British association, and to attend the Montreal meeting, will be furnished with the usual 'travelling certificates' on application to Mr. J. D. Crawford, post-office box 147, Montreal, Canada. These certificates should enable the fellow to purchase conveyance for himself to and from Montreal at reduced rates.

—In regard to the phosphorescence of jelly-fish, R. Meldola writes to *Nature*, that the conclusions arrived at by Mr. Verrill (*Science*, July 4, p. 8) cannot fail to be of interest to all who have ever speculated on the significance of the luminosity displayed by so many *Acalephae*, *Medusae*, and other marine organisms. When in the tropics, in 1875, very similar ideas occurred to Mr. Meldola; and in an address on the phenomena of cyclical propagation, delivered to the Essex field-club on Jan. 28, 1882, he ventured to put forward the following views: "It was in the Bay of Bengal, when on the eclipse expedition of 1875, that I first saw shoals of *Medusae* in their full splendor. Speculating on the meaning of the vivid colors and brilliant phosphorescence of these creatures, I came to the conclusion that both these characters might be protective danger-signals of the same nature, and fulfilling the same function, as the bright colors of distasteful caterpillars according to Wallace's well-known theory, or the phosphorescence of the *Lampyridae* according to Thomas Belt ('*Naturalist in Nicaragua*,' p. 320). The 'urticating' powers of the jelly-fish would certainly make them unpleasant, if not absolutely dangerous to predatory fish, and their bright colors and luminosity at night may thus be true warning characters."

—A joint convention was recently held by the council and past presidents of the British institutions of civil engineers, mechanical engineers, and naval architects, and of the Iron and steel institute, and the Society of telegraph engineers and electricians, to take steps toward the erection of a memorial to the late Sir William Siemens. At a meeting held on June 28, it was reported that the authorities of Westminster Abbey would be pleased to permit the introduction of a memorial window in honor of the distinguished physicist and engineer. The cost was estimated at from seven hundred to eight hundred pounds. The proposal was accepted; and it was decided to limit subscriptions to one guinea each,

and to receive them only from members of one of these five societies, of all of which the deceased was a member. Subscriptions are payable to Mr. James Forrest, secretary of the Institution of civil engineers.

—Dr. Asa Gray's 'Flora of North America,' part ii. (*Caprifoliaceae-Compositae* inclusive), is at length issued. It contains 474 pages, mainly devoted to *Compositae*, which number 1,610 species arranged in 237 genera. For the convenience of distant botanists, it is sent by mail, free of postage, to those who remit the price (\$5), and order it of the curator of Harvard university herbarium, Cambridge, Mass.

—In September next a geographical professorship will be established at each of the Russian universities. In Germany, fourteen out of twenty-one universities have a chair of this sort.

—Lessar is again in the Seraks country, and will explore the middle part of the region watered by the Murghab River, which has never been visited by Europeans.

—The international society for the cure of ophthalmia offers a gold medal for the best essay on diseases of the eye. The medal is designed by Hartzes of Berlin, and bears a portrait of Albrecht von Graefe.

—In Russia the statistics of the last thirty years show a great diminution in the forest-trees, but scantily replaced by the planting of firs, as there is no supervision of forests: there is said to be a consequent change for the worse in the climate, and diminution of fruitfulness, especially in the districts round Nishni Novgorod and Moscow. In the Moscow government, which used to be rich in fruit-bearing trees, apples and cherries have much decreased in number, and pears have wholly disappeared.

—A new fog-horn, invented by Mr. Bryceson, has recently been tried on the Thames by the representatives of the admiralty. It is in the form of a pump, and is worked by a strap fastened to the signalman's foot, and so worked as to produce short or long sounds, as required. The advantages of the invention are, the length of time to which the sound can be drawn out, its cheapness, and the fact that it can be heard for three-quarters of a nautical mile in stormy weather.

—The vertical camera, for use in photographing natural-history objects, is described in a pamphlet, "La photographie appliquée aux sciences biologiques et le physiographie universel," by Dr. A.-L. Donnadieu, and published at Lyon by J.-B. Carpentier.

—In the *Monthly notices* of the Royal astronomical society for May, appears a paper by Professor Hall, upon the motion of Hyperion, the satellite of Saturn just outside of Titan, and whose motion is greatly perturbed by the latter, both on account of its mass, and the nearness and eccentricity of Hyperion's orbit. The mean motion of Hyperion is still somewhat uncertain, from the fact that there are no systematic observations of it since those of Lassell in 1852, until Professor Hall took up the systematic observation of